

REMARKS

Reconsideration of the application is requested in view of the above amendments and the following remarks. New Figures 9A and 9B have been added to the application along with the required written description of those figures in the specification. The Examiner requested the addition of these figures in a phone interview conducted between the Examiner and Applicants' attorney Joshua Randall on February 25, 2003. Figures 9A and 9B are supported by at least Figures 1A to 1C. Claim 1 has been editorily amended to clarify the definition of the substrate side wall. Changes made to the application by the current amendment are shown in the attached "Version with Markings to Show Changes Made."

Claims 1-15 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. As noted above, claim 1 has been amended to more clearly define the substrate side wall. Applicants submit that claims 1-15 are definite.

Claims 1-3 and 9 were rejected under 35 U.S.C. 103(a) as being unpatentable over Sugimoto et al., U.S. 6,243,933 in view Tanaka, U.S. 5,446,429. Applicants respectfully traverse this rejection.

Sugimoto and Tanaka disclose an exciting electrode of the piezoelectric element that has a rectangular shape with an edge of the electrode in the longitudinal direction that is perpendicular to a side wall of the piezoelectric substrate extending in the longitudinal direction. As a result, in Sugimoto and Tanaka a normal line of the edge of the electrode is parallel to the side wall.

In contrast, the first and second exciting electrodes of the piezoelectric element of claim 1 have an edge in a longitudinal direction (illustrated for example by edge 12ae and edge 12be shown in Figures 1A, 1B, and 9B) that is not perpendicular to the side walls of the piezoelectric substrate (illustrated for example by side walls 11c, 11d shown in Figures 1A, 1B and 9B). Thus, Sugimoto and Tanaka fail to disclose an edge in the longitudinal direction of the exciting electrode whose normal is nonparallel to the side wall extending in the longitudinal direction of the piezoelectric substrate, as required by claim 1.

Claim 15 was rejected under 35 U.S.C. 103(a) as being unpatentable over Sugimoto and Tanaka, and further in view of Mandai et al., U.S. 6,064,351. Applicants respectfully traverse this rejection.

As discussed above, Sugimoto and Tanaka fail to disclose or suggest every limitation of claim 1. Mandai fails to remedy the deficiencies of Sugimoto and Tanaka as they relate to claim 1. Therefore, Applicants submit that claim 15 is allowable for at least the reason it is dependent upon an allowable base claim. Applicants do not concede the correctness of this rejection.

Claims 4-6, 7, 8, and 10-14 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Sugimoto and Tanaka, and further in view of Yabe et al., U.S. 6,023,973 and ordinary skill in the art. Applicants respectfully traverse this rejection.

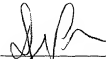
As discussed above, Sugimoto and Tanaka fail to disclose or suggest every limitation of claim 1. Yabe and ordinary skill fail to remedy the deficiencies of Sugimoto and Tanaka as they relate to claim 1. Therefore, claims 4-6, 7, 8 and 10-14 are allowable for at least the reason they are dependent upon an allowable base claim. Applicants do not concede the correctness of this rejection.

In view of the above, Applicants request reconsideration of the application in the form of a Notice of Allowance.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Specification

Paragraph beginning at page 7, line 14 has been amended as follows:

--Fig. 8 is a view showing an example of a conventional piezoelectric vibrator,--

Paragraph beginning at page 7, line 28 has been amended as follows:

--Referring to Figs. 1A to 1C and Figs. 9A and 9B, the piezoelectric vibrator 10 includes a piezoelectric substrate 11 and a pair of exciting electrodes 12a and 12b formed on the piezoelectric substrate 11. The exciting electrodes 12a and 12b are connected to electrodes 13a and 13b for interconnection, respectively. The electrodes for interconnection can be formed along the entire width in the traverse direction of the piezoelectric substrate 11, as shown in Figs. 3A to 3F.--

In the Claims

Claim 1 has been amended as follows:

1. (Twice Amended) A piezoelectric element comprising:
a piezoelectric substrate having a shape of an elongated rectangular solid, and
first and second exciting electrodes formed on a part of at least one principal plane selected from the group consisting of a first principal plane of the piezoelectric substrate and a second principal plane opposed to the first principal plane,
wherein thickness shear vibration occurs,
a vibration direction of the thickness shear vibration is nonparallel to a side wall extending in a longitudinal direction of the piezoelectric substrate, and
a normal line of an edge in the longitudinal direction of the first exciting electrode and a normal line of an edge in the longitudinal direction of the second exciting electrode are parallel to each other, and are nonparallel to the side wall extending in the longitudinal direction of the piezoelectric substrate.

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